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ABSTRACT

Sensing a need for change in the dentistry curriculum, faculty members from the School of Dentistry of the University of Louisville met with educational and psychological consultants with the purpose of updating the present didactic and organizational program. A Discrepancy Analysis System (DAS), also called Cognitive Dissonance, was chosen to implement a program designed to develop the problem solving and issue resolution processes. The DAS is based on a Skinnerian behavioral theory of motivation and a cognitive theory of motivation. Both identify a beginning point and an end point, or goal. The DAS is concerned with the discrepancy (degree of variance) between these two points. Using this concept of discrepancies, a four stage process for problem solving was developed. The following steps were identified: (1) Problem/issue identification; (2) Problem/issue formulation; (3) Search for alternatives and strategies; (4) Problem resolution. An integral component of this DAS model is a self-renewing norm, which in time should reduce the amount of discrepancy. This paper includes the instruments that were used in developing this model and recommendations for further uses of this model in the dentistry curriculum. (MA)

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UTILIZATION OF THE DISCREPANCY ANALYSIS SYSTEM IN
THE ORGANIZATIONAL DEVELOPMENT OF TEACHING
PROBLEM SOLVING AT THE UNIVERSITY OF
LOUISVILLE SCHOOL OF DENTISTRY

by

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The teaching of explicit psychomotor skills, in the School of Dentistry of the University of Louisville, as well as development of the cognitive and affective domains, has been the thrust of the faculty of the Section of Treatment Planning. To resolve issues between basically didactic instruction and the organization of the distinct units of the School of Dentistry, a faculty development inservice program was initiated.⁽¹⁾ By consensus, a process for problem solving and issue resolution was adopted - utilization of the discrepancy theory of problem sensing as the overall mode.

The inservice program combined the resources of faculty members of the units of the School of Dentistry and consultants whose disciplines were educational and psychological in orientation. Following the inservice program, a week of day and night sessions at a "retreat" type setting (Gardencourt, an antebellum mansion owned by the University) was planned for the purpose of preparing an "in-house" cadre of faculty to act as consultants to any departments requesting their services. The Treatment Planning Section, desiring to update its didactic and organizational program, decided to utilize this approach and requested the services of members of the in-house consultants.

An investigation of the literature relevant to Discrepancy Analysis, or its other term, Cognitive Dissonance,⁽²⁾ revealed limited sources; yet, in reading the referencing bibliographies, the evolution and utilization of this Discrepancy Analysis System, or comparable techniques, became evident. It was found that major industry and the armed services (supported by government grants) develop and rely upon this system quite heavily.^(3,4) Then, it was picked up, experimented with, and refined in

the arena of the elementary schools, finally to be revealed as a new vision to higher education. This evolution of development can also be traced through Skinnerian Behavioralism to Cognitive Motivation, now in vogue, having come full circle in philosophical sympathy with the Gestalt days of the turn of the century.⁽²⁾ One of the better discussions and expositions of the Cognitive Dissonance theory was proposed by Festinger in 1957, when he described the criteria of dissonant cognitions.^(2,5) The Formulation of Behavior was proposed by Skinner in 1957 utilizing the Verbal Behavior approach.^(2,6) In 1965 and 1967 Bem, borrowing heavily from Skinner, made his formal statement concerning the formulation of Verbal Behavior in regard to Cognitive Dissonance.

Stated in utmost simplicity, the behavioral theory of motivation as espoused by B.F. Skinner^(2,6) and others, sets a goal achievement of specific behavioral objectives implemented with extrinsic rewards along the road to achievement. This has been amply demonstrated as working successfully with animals and children.

The cognitive theory of motivation primarily for adult utilization is, again simplistically, the determination of end point achievement: the student begins at one point and arrives at an overall concept of the end point.



FIG. 1

Box 1 is "where you are" or "what they know". Box 2 is "where you want to be" or an intrinsic perception of "what they want or have to know".

Perceived movement without reward is motivation enough and is self-reinforcing. Motivation is perceived motion in the discrepancy between Box 1 and Box 2. Expressed another way: to reduce the perceived discrepancy is to have fun or to feel good, and is reward enough.

Any discussion of a Discrepancy Analysis System (DAS) which identifies the difference in Expected Performance and Actual Performance should be revealed by some testing procedure. One way to formulate the initial problem statement (identify the problem), is to utilize a DAS by first determining the levels of the DAS: then to specify expected performances at each level. Procedures must be established for determining a discrepancy between expected performance and actual performance.

One procedure is the distribution to selected population and interest groups. Finally, one is prepared to compose meaningful problem statements. The preceding process was proposed by H.R. Kite in Educational Technology.⁽⁹⁾

Expected performance should be specified, be it goal, objective or output to be achieved. Completing the prescribed task necessary to implement the DAS requires writing what is to be achieved as a precise objective, which should include conditions - primarily time, criteria, and the expected level of performance. By comparing expected performance with actual performance, a degree of discrepancy can be ascertained. Using this measured degree of discrepancy, one can formulate problem statements.

Testing (questionnaires) to determine acceptable discrepancy, as opposed to the original discrepancy which was not acceptable, caused the sensing of an existing problem.⁽¹⁾

Analysis is comparing planned performance with actual performance. This variance between the two is the discrepancy. The important point here is: how much of a degree of variance is an acceptable discrepancy? Simple answers to this question are unacceptable.

An instrument, then, had to be devised by the consultants to the Section of Treatment Planning to clarify the issues which, at this time, were only sensed, and to quantify their varying intensities for priority analysis at a later time. As in all problem solving, a diagnosis had to be arrived at, and in this case it had to be data based. This data based diagnosis was to show discrepancies between:

- what one thinks and feels
- what one predicts others think and feel
- what others actually think and feel
- what is ideal.

The facilitating outside consultant group helped the faculty arrive at a generalized problem solving/issue resolution process, along with data base utilization for the development of the specific instrument (questionnaire) for our special problem utilization. The process for problem solving is as follows:

- Stage I: Problem/issue identification
 - a. initial sensing and detection of problem
 - b. surfacing problem and increasing each person's awareness of it

- Stage II: Problem/issue formulation
 - a. clarification of problem
 - b. analysis of causes, forces at work, etc.
 - c. problem diagnosis and "ownership"
- Stage III: Search for alternatives and strategies
 - a. hypothesizing alternative solutions
 - b. devising strategies
- Stage IV: Problem resolution
 - a. analysis and evaluation of alternatives
 - b. proposing solutions
 - c. resolving

The consensus of the faculty of Treatment Planning perceived the existence of problems both didactic and organizational, and a commitment was made to the utilization of the organizational and developmental process, based on a data base gleaned by Discrepancy and Instruments for problem solving. The consultants then initiated their portion of the process.

To best illustrate this process, the following diagram for process was generated.

THE PROCESS OF ORGANIZATIONAL DEVELOPMENT USING DISCREPANCY
THEORY LEADING TO SELF-REALIZATION

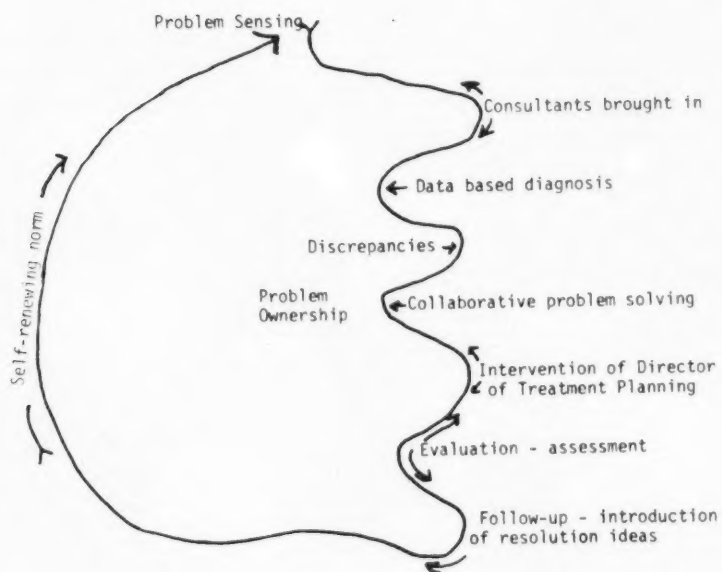


FIG. II

Figure II

The continuity impact of the utilization of that part of Figure II labeled the self-renewing norm, should alter the acceptable discrepancy. The degree of variance should decrease with time, if one has analyzed the discrepancy and improved the alternative techniques of attaining the original objectives.

"If a program does not function as prescribed, student achievement will be influenced. Objectives above the achievement of the student will always result in unacceptable discrepancies."⁽⁹⁾

In a paper presented in Chicago in 1974, B.G. Davis proposed a Design and Implementation of a DAS model for educational programs. He said, "A management and evaluation of educational programs requires a timely and accurate information system."⁽¹⁰⁾ The DAS model he described aids in providing this information which may be processed. Building from statements of expected performance, this study showed how questionnaires may be developed, analysis plans prepared, and analytical reports produced to enable a viewer to quickly learn the status of the educational process.

In another report presented to the School of Education of San Diego State University in 1972, by M.R. Mazon, the researcher proposed that instrument designs for DAS application be so designed that the programs be constantly held accountable, not only for the attainment of their stated objectives, but also for their time frame for achievement of those objectives.⁽¹¹⁾

Illustrations of Figures III and IV are samples of page 1 of the 8 to 10 page analyzing instruments (questionnaires). Figure 3 was a working exercise for those faculty selected to attend the workshop.

UNIVERSITY OF LOUISVILLE
LIBRARY QUESTIONNAIRE

Faculty & Administration _____ Staff _____ Student Assistants _____

The following questions have been designed to help the Main Library in its efforts to improve the quality of services it provides for the University. We appreciate your cooperation in completing this questionnaire.

1. What are the 3 things that you like most about working at the library?
 1. _____
 2. _____
 3. _____
2. List the 3 major tensions that keep the library from operating as effectively as it might.
 1. _____
 2. _____
 3. _____
3. How much influence do you have in decisions which affect you?
 1 2 3 4 5 6 7 8 9
 none A great deal
4. How much influence would you like to have in decisions which affect you?
 1 2 3 4 5 6 7 8 9
 none A great deal
5. What are the 3 most important services that the library provides for the University?
 1. _____
 2. _____
 3. _____
6. In what 3 areas could the library improve, to serve the University more effectively?
 1. _____
 2. _____
 3. _____
7. As you see it, how would those whom the library is supposed to serve describe its 3 major weaknesses?
 1. _____
 2. _____
 3. _____
8. To what extent does the library solicit the needs, ideas, suggestions of those who use the library?
 1 2 3 4 5 6 7 8 9
 not at all a great deal

Figure III

Below line
 Pe - Periodontics
 Pv - Preventive
 Rest - Restorative
 E - Endodontics
 Or - Orthodontics
 OS - Oral Surgery
 Pr - Prosthodontics
 Above line
 F - Faculty
 TP - Treatment Planning

TREATMENT PLANNING
 FACULTY QUESTIONNAIRE

Unit Tp Planning

This questionnaire is designed to gather information on how well Treatment Planning is fulfilling our needs. If you feel that changes are indicated, please complete the questionnaire and return it to the Secretary of your Unit. Thank you.

1. To what degree is the present Treatment Planning Board meeting our needs?

Place an "X" where you presently view this variable.

1 2 3 4 5 6 7 8 9
 not at all completely
 F TP

2. The following are a series of questions about the Goals of the Treatment Planning Sessions.

Place an "X" where you presently view this variable.

Place an "O" where you think the students presently view this variable.

- A. For the purpose of Processing and Service to Patients, to what extent are the Goals of the Treatment Planning Board clear to you?

1 2 3 4 5 6 7 8 9
 not clear at all totally clear
 PV OS PV OR PR PL R TP

COMMENT:

- B. For the purpose of Education for Students, to what extent are the Goals of the Treatment Planning Board clear to you?

1 2 3 4 5 6 7 8 9
 not clear at all totally clear
 PV OS PV OR PR PL R TP

COMMENT:

3. 1 2 3 4 5 6 7 8 9
 smile frown
 TP F

The main library on campus requested our services and utilized our recommendations in designing the organizational development of the proposed new library.

Figure IV was the first working summary page of the Treatment Planning questionnaire combining all population group responses. The resulting information this instrument uncovered for us was neither new nor unexpected. However, it assisted us in quantifying our problems and enabled us to apply priority weight to the various questions which needed to be addressed.

The following is the preamble of the annual report of progress and goal statement of the Section of Treatment Planning. It is the direct result of the DAS experience and was intended to be the pilot utilization for other departments.

Short range planned changes of the Section of Treatment Planning will be directed toward the suggested and logical areas of instruction, research, service, faculty development and organization development.

INSTRUCTION:

I. Goals

- A. To continue to develop the problem solving component of the Sophomore didactic Treatment Planning course with emphasis on alternative teaching methods such as:
 - 1. small group participation in the analysis of data
 - 2. a process for problem solving in a collaborative mode, utilizing such steps as:

- a. problem identification
 - b. problem formulation
 - c. search for alternatives
 - d. problem resolution
- B. To develop a more effective evaluation process for the Sophomore didactic Treatment Planning course.
 - C. To institute and evaluate a criterion-referenced evaluation system in the Junior and Senior clinical Treatment Planning course.
 - D. To evaluate the effect of the Sophomore didactic course on the Junior clinical performance.
 - E. To expand the available teaching material as resources for both didactic and clinical activities.

Measurability of the success of this didactic endeavor and the strengthening of the educational aspect of clinical treatment planning during Treatment Planning Board sessions will be determined by student's clinical performance in general and specifically by a newly instituted criterion-referenced proficiency evaluation in the Junior and Senior years.

The next step is to requery the original groups and enter the cycle all over again, making this point, the self-renewing norm. If our analyses were correct, some of the disturbing discrepancies will have been narrowed.

REFERENCES

1. The Athyn Management Development Group, Philadelphia, Pa.: Workshop - Organizational Development - at Univ. Lou. School Dent. Oct. 20-24, 1975
2. Wyer, R.S., Sr.: Cognitive Organization and Change; an Information Processing Approach. Lawrence Erlbaum Associates, Publishers. Potomac, Maryland 1974 374-402
3. Bellarie, A.: Monitoring Commercial Performance - It's Time to Take it Seriously. Advertising Age 44:N 51 50-54 Dec. 10, 1973
4. Lambert, D.R. et al: The Industrial Buyer and the PostChoice Evaluation Process. Jnl. of Marketing Research 4: N2 246-51 May 1977
5. Festinger, L.A.: A Theory of Cognitive Dissonance. Stanford: Stanford Univ. Press 1957. P. 13
6. Skinner, B.F.: Verbal Behavior New York: Appleton-Century-Crofts 1957
7. Bem, D.J.: Self Perception: An Alternative Interpretation of Cognitive Dissonance Phenomena. Psych. Rev. 74: 183-200 1967
8. Bem, D.J.: Theory of Self Perception in Text by Wyer, R.S. 403-425
9. Kite, H.R.: Discrepancy Analysis Systems. Ed. Tech. 16 24-28 Apr. 1976
10. Davis, B.G.: Design and Implementation of a Discrepancy Analysis Model for Education Programs. Paper presented at the Annual meeting of the American Educational Research Associates, Chicago Apr. 1974
11. Mazon, M.R.: A Design for Bilingual/Bicultural Education. Special report, School of Education San Diego State University. Mar. 1972